REMARKS

This is a response to the ***Advisory Action*** dated August 1, 2002. Claims 24-26 and 28-48 are pending in the present application. In light of the accompanying Request for Continued Examination filed under 37 CFR §1.114 and the following remarks, reconsideration and allowance of pending claims 24-26 and 28-48 are requested.

In the ***final rejection*** dated April 5, 2002, the Examiner has rejected claims 24-26 and 28-48 under 35 USC §103(a) as being unpatentable over U.S. patent number 6,069,397 to Cornett et al. ("Cornett") considered alone, or over Cornett in view of U.S. patent number 5,446,311 to Ewen et al. ("Ewen"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by independent claims 24, 31, and 37, is patentably distinguishable over Cornett, Ewen, or any combination thereof.

The present invention, as defined by independent claims 24 and 37, respectively, teaches a conductor or inductor patterned in a second area of a dielectric. A permeability conversion material is interspersed within the second area of the dielectric such that the permeability of the second area of the dielectric is higher than the permeability of a first area of the dielectric. Thus, as disclosed in the present application, the permeability conversion material increases the permeability of the second area of the dielectric. As disclosed in the present application, "interspersing" is defined as the collective process of implantation, sputtering, or any other process used to introduce high permeability material into the dielectric material which surrounds an inductor. See, for example, page 12, lines

8-11 of the present application. Thus, through "interspersing," a high permeability material is introduced into a dielectric material that already surrounds an inductor. In other words, a high permeability material is "interspersed" into the dielectric material after the dielectric material and the inductor have been fabricated.

By interspersing the permeability conversion material within the second area of the dielectric, the amount of permeability conversion material can be controlled to achieve a desired increase in the permeability of the second area of the dielectric. For example, a small amount of very high permeability material, such as a nickel-iron alloy, interspersed within the second area of the dielectric can result in a significant increase in the permeability of the second area of the dielectric.

Additionally, increasing the permeability of an area of a dielectric by interspersing permeability conversion material within the dielectric area advantageously allows control over the particular area of the dielectric in which the permeability conversion material is dispersed. For example, the permeability conversion material may be dispersed only in an area of the dielectric that includes an inductor, and not in a neighboring dielectric area, which is situated in the same dielectric layer.

In contrast, Cornett and Ewen do not, singly or in combination, teach, disclose, or suggest a permeability conversion material interspersed within a second area of a dielectric including an inductor or conductor, such that the permeability of the second area of the dielectric is higher than the permeability of a first area of the dielectric. Cornett specifically discloses inductor 220 implemented as a layer of integrated circuit

200. See, for example, Cornett, column 2, l.nes 17-18. Inductor 220 is situated over passivation layer 217. See, for example, column 2, lines 12-25 and Figure 2 of Cornett. Inductor 220 includes patterned conductive trace 110, i.e. an inductor, and is formed by depositing a first layer of magnetic material, i.e. magnetic material layer 221, on passivation layer 217. Conductive trace 110 is then patterned on magnetic material layer 221 and a second layer of magnetic material, i.e. magnetic material layer 223, is disposed on both patterned conductive trace 110, i.e. an inductor, and magnetic material layer 221. See, for example, Cornett, column 2, lines 43-48.

In Cornett, magnetic material layer 223 already comprises electrically non-conductive magnetic material when magnetic material layer 223 is disposed over and surrounds conductive trace 110. Thus, patterned conductive trace 110 is not first surrounded by a dielectric layer that subsequently has its (the dielectric layer) permeability increased by having a permeability conversion material interspersed into the dielectric layer. In fact, Cornett does not teach, disclose, or suggest any permeability conversion material that is interspersed within a dielectric area to increase the permeability of the dielectric area. For the foregoing reasons, Applicant respectfully submits that the present invention, as defined by independent claims 24 and 37, is not suggested, disclosed, or taught by Cornett.

The Examiner has stated that Ewen has been cited to teach that a conventional passivation/dielectric layer comprises silicon oxide and thus, it would have been obvious to use a dielectric layer, i.e. dielectric layer 2 in Figure 3 of Ewen, comprising silicon

oxide in Cornett in order to insulate the device with a conventional insulating material. In the interest of completeness, Applicant respectfully submits that independent claims 24 and 37 are distinguishable over Ewen. As discussed above, the present invention, as defined by independent claims 24 and 37, teaches a permeability conversion material that is "interspersed" within a second area of a dielectric including an inductor or conductor, such that the permeability of the second area of the dielectric is higher than the permeability of a first area of the dielectric.

In contrast, Ewen specifically discloses a spiral inductor structure having three levels of metal connected by vias. See, for example, Ewen, column 2, lines 11-28. Each metal level is, in turn, situated on a layer of silicon oxide to isolate the metal levels. See, for example, Ewen, column 2, lines 14-24. In Ewen, the spiral inductor structure includes two identical spiral metal patterns connected in parallel on two different metal levels to reduce DC resistance. See, for example, Ewen, column 2, lines 26-31. However, Ewen does not teach, disclose, or suggest an increased permeability of any of the silicon oxide layers resulting form interspersion of permeability conversion material within the silicon oxide layer. In fact, Ewen does not teach, disclose, or suggest increasing the permeability of any of the silicon oxide layer in any manner. For the foregoing reasons, Applicant respectfully submits that the present invention as defined by independent claims 24 and 37 is not suggested, disclosed, or taught by Ewen, either singly, or in combination with Cornett. As discussed above, independent claims 24 and 37 are patentably distinguishable over Cornett and Ewen and, as such, claim 26 and claims 28-30

depending from independent claim 24 and claims 38-48 depending from independent claim 37 are, a fortiori, also patentably distinguishable over Cornett and Ewen.

The present invention, as defined by independent claim 31, teaches an inductor patterned in a dielectric having a first permeability. A permeability conversion material having a second permeability is interspersed within the dielectric, where the second permeability is greater than the first permeability. Thus, as discussed above, the permeability conversion material is interspersed within the dielectric to increase the permeability of the dielectric. The fact that a permeability conversion material is interspersed within a dielectric, where the permeability of the permeability conversion material is greater than the permeability of the dielectric, and where the dielectric surrounds the inductor prior to receiving interspersed permeability conversion material, results in the various advantages discussed above. As such, and based on the foregoing reasons in relation to independent claims 24 and 37, independent claim 31 is patentably distinguishable over Cornett and Ewen, either singly or in combination. Thus, claims 32-36 depending from independent claim 31 are also patentably distinguishable over Cornett and Ewen.

Based on the foregoing reasons, the present invention, as defined by independent claims 24, 31, and 37 and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 24-26 and 28-48 pending in the present application are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of claims 24-26 and 28-48 pending in the present RCE application is respectfully requested.

Respectfully Submitted,
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